

# New Interactive Display Tracks the 3-Dimensional Motion of the Human Hand

NASA offers companies the opportunity to license and/or jointly develop this innovative technology.

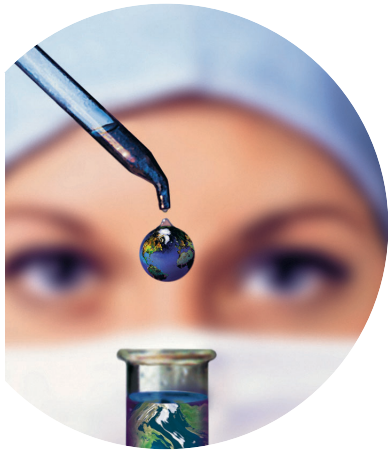


**Goddard Space Flight Center** has developed the Transparent Capaciflector 3-D Interactive Display. Placed on the transparent glass of a display screen, capaciflector sensors track the 3-dimensional motion of fingers and hands in front of the screen. The screen then displays this motion in real-time. The technology allows for wireless communication between information management systems, such as personal computers, and their users. It may also be used to enhance 3-D imaging programs such as computer-aided design (CAD), geographic information systems (GIS), and medical imaging software.

## Benefits

- **User Friendly**—Allows for communication with computers without using a mouse or stylus, and without the need to physically touch a display screen.
- **Versatile**—Can be used with information management systems ranging in size from handheld devices (e.g., cell phones, personal digital assistants) to computers with large monitors.
- **Cost-effective**—Uses common industrial circuits that are cheap to produce. In addition, the technology will make it less expensive to place multiple devices (e.g., cell phones, pagers, calculators, television remote controls, personal digital assistants) into a single handheld unit.
- **Precise**—Features dramatically increased detection range and sensitivity over competing technologies.
- **Stable**—Exhibits virtually no cross-talk (i.e., no problems from thermal drift), even though the sensors are separated by only a few thousandths of an inch in the array.
- **Rugged**—Performed flawlessly as a proximity sensor on the feet of the Dante robot, which walked into the extreme environment of an Antarctic volcano.
- **Efficient**—Requires milliwatt power, which makes the technology well-suited for industrial, embedded, and remote applications.





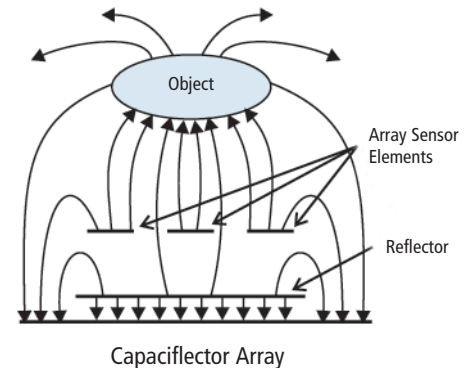
## Commercial Opportunities

The Transparent Capaciflector 3-D Interactive Display is part of NASA's technology transfer program. This program seeks to promote commercial use of NASA-developed technologies. NASA Goddard Space Flight Center holds several patents for the capaciflector technology. A prototype unit has been constructed to demonstrate the technology's ability to enhance interactive displays. NASA is looking for companies to license the technology and/or partner with Goddard in future development.

## The Technology

NASA's Goddard Space Flight Center originally developed the capaciflector technology to help avoid collisions during space missions. In this role, the capaciflector sensors allowed robots working in a zero-gravity environment to detect and identify humans and other objects before making contact. Goddard has recently adapted the technology for use as a novel interface between information management systems, such as personal computers, and their users.

When capaciflector arrays are placed on the transparent glass of a display screen, they can sense, locate, and follow the proximity of objects, such as human fingers and hands. The sensors then show the 3-dimensional movement of the object in real-time on the screen. This technology, known as Transparent Capaciflector 3-D Interactive Display, allows for communication between operator and computer in a wireless mode, with no need for a mouse or stylus. The technology can be used for a variety of human/machine interface applications, from personal computers to bank teller machines. In addition, it is well-suited for computer software that requires the 3-D manipulation of objects (e.g., medical imaging software, video games, CAD).



## Commercial Applications

- **Human/Machine Interfaces**—The technology can be used to convert the display screens of information management systems into wireless interfaces. These systems may include personal computers, televisions, cell phones, personal digital assistants, automatic teller machines, and household appliances.
- **Enhancement of 3-D Imaging Software**—The technology allows for “virtual grasping” and manipulation of object images. For example, a user could virtually grasp an object image on the screen and rotate the object to get another view. This feature makes the technology ideal for use with programs such as CAD, GIS, video games, and medical imaging software.
- **Personal Computers**—The technology can simplify word processing functions, allow for a 3-dimensional virtual joystick, and create user-friendly writing and drawing pads.

More information about working with the NASA Goddard Technology Commercialization Office is available online. \_\_\_\_\_

*<http://techtransfer.gsfc.nasa.gov>*

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